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Note by Secretary-General

The Secretary-General has the honour to transmit to the Security Council the thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission, which is submitted in accordance with paragraph 12 of Security Council resolution 1284 (1999) of 17 December 1999 (see annex).

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Annex

Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission in accordance with paragraph 12 of Security Council resolution 1284 (1999)

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I. Introduction and salient points

1. The present report, which is the thirteenth[a] submitted in accordance with paragraph 12 of Security Council resolution 1284 (1999), covers the activities of the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC) during the period from 1 March to 31 May 2003. The present introduction highlights some of the events and experience of the Commission.

2. During the period under review, the Executive Chairman of UNMOVIC briefed the Security Council on 7 March (on the twelfth quarterly report), on 19 March (on the draft work programme required under resolution 1284 (1999)) and on 22 April 2003 (on the Commission's readiness to return to Iraq to resume inspections). He also maintained his practice of meeting each of the respective Presidents of the Security Council. The Secretary-General and his senior staff were kept informed on a continuing basis of the activities of the Commission.

3. On 18 March 2003, UNMOVIC suspended its inspection activities following the decision of the Secretary-General to withdraw all United Nations staff from Iraq. The armed action started on 19 March 2003, and the Coalition has organized units to identify any Iraqi weapons of mass destruction and other proscribed items and to engage in the task of disarming Iraq, which was formerly pursued by UNMOVIC and the International Atomic Energy Agency (IAEA).

4. Following the withdrawal from Iraq, UNMOVIC staff drawn from the roster were sent home and contracts for services, such as transportation by fixed- and rotary-wing aircraft, were ended or assigned to other United Nations operations. UNMOVIC headquarters staff have been and remain engaged in analysis of the inspections performed and in the updating of site files, subject files and other documentation in the light of the inspection reports. A thorough review is also being undertaken of the voluminous information provided by Iraq, not least during the period under review in the present report. In the months to come, it may also be desirable that UNMOVIC headquarters staff engage in summarizing and digesting the unique experience gained in such areas as defining dual-use materials and monitoring the export/import of dual-use items.

5. The findings and experience of the relevant units established by the Coalition have not been made available to the Commission except through public media reports. Nor have those units or the Coalition requested any information or assistance from the Commission.

6. In resolution 1483 (2003) of 22 May 2003, the Security Council reaffirmed the importance of the disarmament of Iraqi weapons of mass destruction and the eventual confirmation of the disarmament of Iraq. In paragraph 11, the Council reaffirmed that Iraq must meet its disarmament obligations, invited the United Kingdom of Great Britain and Northern Ireland and the United States of America to keep the Council informed of their activities in that regard, and underlined its intention to revisit the mandates of UNMOVIC and IAEA as set forth in several earlier resolutions.

7. Since the Commission's work on disarmament in Iraq, which began on 27 November 2002, has been suspended, and since a significant phase of that work has been concluded, the present report provides more detail than previous reports. In

addition, the report does not restrict itself to reviewing information from the period 1 March to 31 May 2003 but in a number of places adopts a wider perspective.

8. In the period during which it performed inspection and monitoring in Iraq, UNMOVIC did not find evidence of the continuation or resumption of programmes of weapons of mass destruction or significant quantities of proscribed items from before the adoption of resolution 687 (1991).

9. Inspections uncovered a small number of undeclared empty chemical warheads which appear to have been produced prior to 1990. Those and a few other proscribed items were destroyed.

10. Following a determination by the Commission that the Al Samoud 2 missile system exceeded the range limits set by the Security Council and hence was proscribed, the Commission implemented a programme for destruction. Some 70 missiles and associated equipment were destroyed under Commission supervision before its operations were suspended. At that time, a decision by the Commission was pending as to whether the Al Fatah missile system also exceeded the ranges set by the Council.

11. Inspections and declarations and documents submitted by Iraq, not least during the period under review, contributed to a better understanding of previous weapons programmes. However, the long list of proscribed items unaccounted for and as such resulting in unresolved disarmament issues was not shortened either by the inspections or by Iraqi declarations and documentation. From the end of January 2003, the Iraqi side, which until then had been cooperative in terms of process but not equally cooperative in terms of substance, devoted much effort to providing explanations and proposing methods of inquiry into such issues as the production and destruction of anthrax, VX and long-range missiles. Despite those efforts, little progress was made in the solution of outstanding issues during the time of UNMOVIC operations in Iraq.

12. For example, as described in the present report, extensive excavations undertaken by the Iraqi side and witnessed by inspectors showed that a large number of R-400 bombs declared to have contained biological agents and to have been unilaterally destroyed in 1991 were in fact destroyed. While it was valuable in suggesting the credibility of some information provided earlier, the operation could not verify the total quantities of biological agents destroyed, still less the total quantities produced.

13. Again, with respect to anthrax, the Commission, as it reported, had strong indications — but not conclusive evidence — that all the quantities produced had not been destroyed, and that hence even today such quantities could remain. While the Iraqi side continued to claim that no documentary evidence remained of the destruction operation, it took two different steps in an effort to prove its declaration that all had been destroyed. As described in the present report, the Iraqi side undertook a chemical analysis of soil samples from the site where a quantity of anthrax was declared to have been dumped in 1991. While the results of the analysis were consistent with the declaration that anthrax had been dumped at the site, the study could not provide evidence of the quantities destroyed. The other step taken by the Iraqi side was to supply lists of the persons who in 1991 had been engaged in the operations to destroy anthrax. Regrettably, those lists were received only shortly

before the suspension of inspections and the Commission did not have the opportunity to embark on a series of potentially important interviews.

14. By the time inspections were suspended, the Commission had performed a number of inspections to try to verify, as described in the present report, intelligence information that Iraq had mobile units for the production of biological weapons. The Iraqi side denied that any such units existed and provided the Commission with pictures of legitimate vehicles, which they suggested could have been mistaken for mobile units. However, none of the vehicles in those pictures resembles the trucks recently described and depicted by the Coalition.

15. As also described in the present report, the Commission was not able, before the suspension of inspections, to complete its inquiry into the Iraqi programmes of remotely piloted vehicles and unmanned aerial vehicles, notably to establish whether any of them were designed for the dissemination of chemical or biological weapons or had a longer range than was permitted. Extensive Iraqi information on the programme was sent to the Commission as late as 19 March 2003.

16. At the end of the present report, the Commission's readiness for resumed inspection activities is described. Until the Security Council revisits the mandate of the Commission, the resolutions which guided its work until the armed action will continue to be implemented to the extent that they are still relevant and have not been rendered obsolete by resolution 1483 (2003). It is clear that most of the work which the Commission has performed to date relating to the Oil for Food Programme will be phased out, and that as a result some staff will be released. A readiness for possible resumed work in Iraq, for example to confirm findings that may have been made since the end of the Commission's inspections and/or to perform the task of ongoing monitoring and verification, can be maintained with a somewhat smaller staff than the Commission currently has at its headquarters, thereby reducing costs. However, it would be inadvisable to undertake any drastic overall reduction in the current cadre of staff, which is fully acquainted with the database and vast archives of the United Nations Special Commission (UNSCOM) and UNMOVIC and has broad knowledge of programmes, sites and relevant contacts in Iraq, as well as the logistics of inspection operations.

II. Inspections in Iraq

A. General

17. From the day of the first inspection in Iraq on 27 November 2002 until the day of the withdrawal of all United Nations personnel on 18 March 2003, UNMOVIC conducted 731 inspections, covering 411 sites, 88 of which had not been inspected before. The sites had either been declared by Iraq during inspections or through their semi-annual declarations, or had been selected by UNMOVIC on the basis of outside information. Aerial inspections were also conducted using UNMOVIC helicopters.

18. During the first several weeks of inspections, the focus was on re-establishing a baseline for the sites, that is, to assess the current activities and equipment at the site, determine the changes made since 1998 and identify existing key personnel. Sites visited included previously known sites and new sites for the most part

identified through Iraq's newly provided declarations. Almost all inspections were undertaken without notice to Iraq. Visits of sites followed no order in terms of nature of site, apparent importance and location. The early inspections provided knowledge about Iraq's current programmes and about the main state companies involved in such activities. As information became available from a study of Iraq's recent semi-annual declarations and its "currently accurate full and complete declaration of 7 December 2002, a number of inspections were undertaken to verify or clarify various matters in these documents.

19. The second period, from mid-January until the suspension of activities in Iraq in mid-March 2003, was characterized by reinspection of some of the sites, with a more investigative approach. During those inspections, a thorough assessment was made of both dual-use capabilities and the amount of time that would be needed to reconfigure specific installations to perform proscribed activities.

20. Figure I illustrates the number of UNMOVIC site inspections made per week during the inspection period. The figure shows the initial period of build-up of the inspection teams until the middle of December and the high intensity of inspections over the rest of the period. Figure II illustrates the distribution of the inspection effort over different types of sites. The largest effort was expended on industrial and research and development sites, followed by military sites, including military depots. The distribution of inspections among the missile, chemical, biological and multidisciplinary teams is shown in figure III, while the geographic distribution of inspected sites throughout Iraq is shown in figure IV. As can be seen from figure IV, the relatively large concentration of inspections in the Mosul area underscores the rationale for establishing a regional office there. By the time of the withdrawal, UNMOVIC had not established a regional office in Basrah.

B. Biological inspections

21. Biological inspections were made of university laboratories, pharmaceutical factories, munitions stores, military sites, warehouses, vaccine production and food-processing facilities, breweries, research institutions and agricultural sites. A biological analytical laboratory was established at the Baghdad Ongoing Monitoring, Verification and Inspection Centre (BOMVIC) for sample processing and screening.

C. Chemical inspections

22. Chemical inspections covered pesticide and organophosphorus-related facilities, the petrochemical industry, fertilizer plants, munitions storage and military sites, research and academic institutions, warehouses, chemical production equipment and chemical engineering sites.

23. During the first period of inspections, from December 2002 to mid-January 2003, priority was given to inspections of key sites. Those inspections enabled UNMOVIC to develop an overview of the current status of the chemical industry and related services in Iraq.

Figure 1

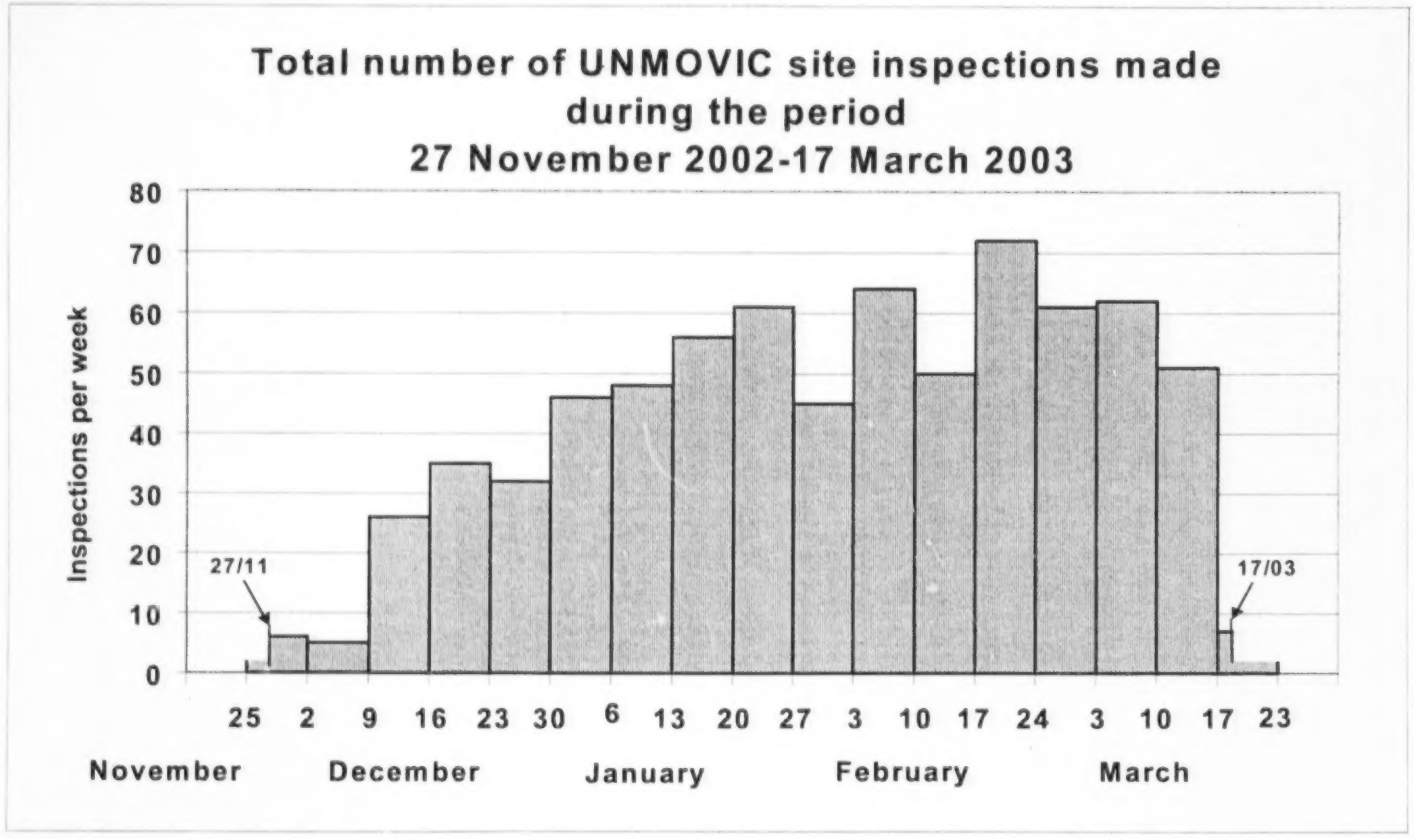

Total number of UNMOVIC site inspections made during the period 27 November 2002-17 March 2003
Inspections per week
80
70
60
50
40
30
20
10
0
27/11
17/03
25 2 9 16 23 30 6 13 20 27 3 10 17 24 3 10 17 23
November
December
January
February
March

Figure II

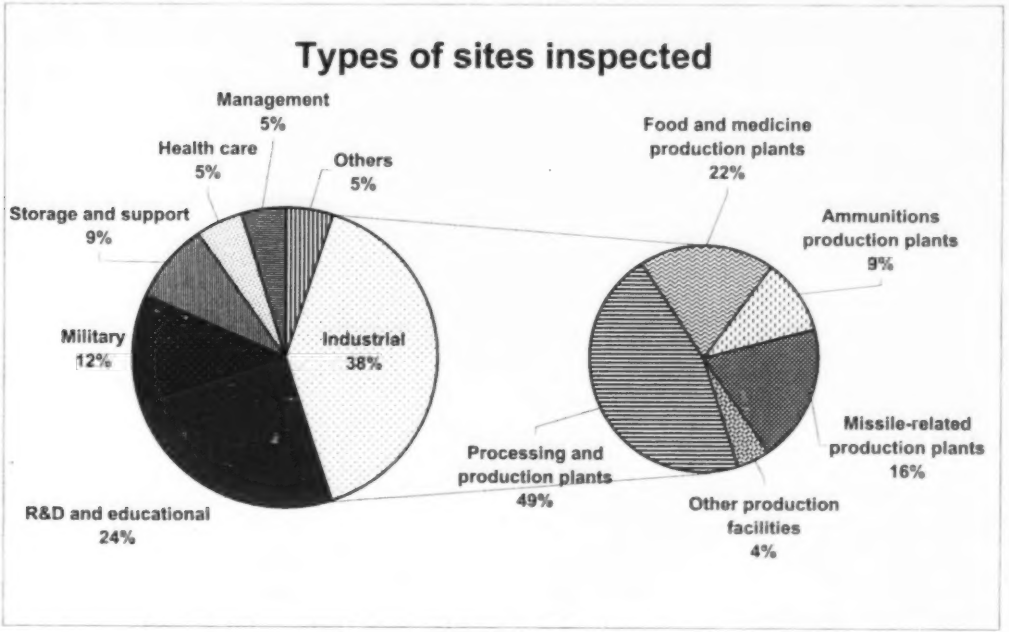

Types of sites inspected
Management 5%
Health care 5%
Others 5%
Storage and support 9%
Military 12%
Industrial 38%
R&D and educational 24%
Food and medicine production plants 22%
Ammunitions production plants 9%
Missile-related production plants 16%
Other production facilities 4%
Processing and production plants 49%

Figure III

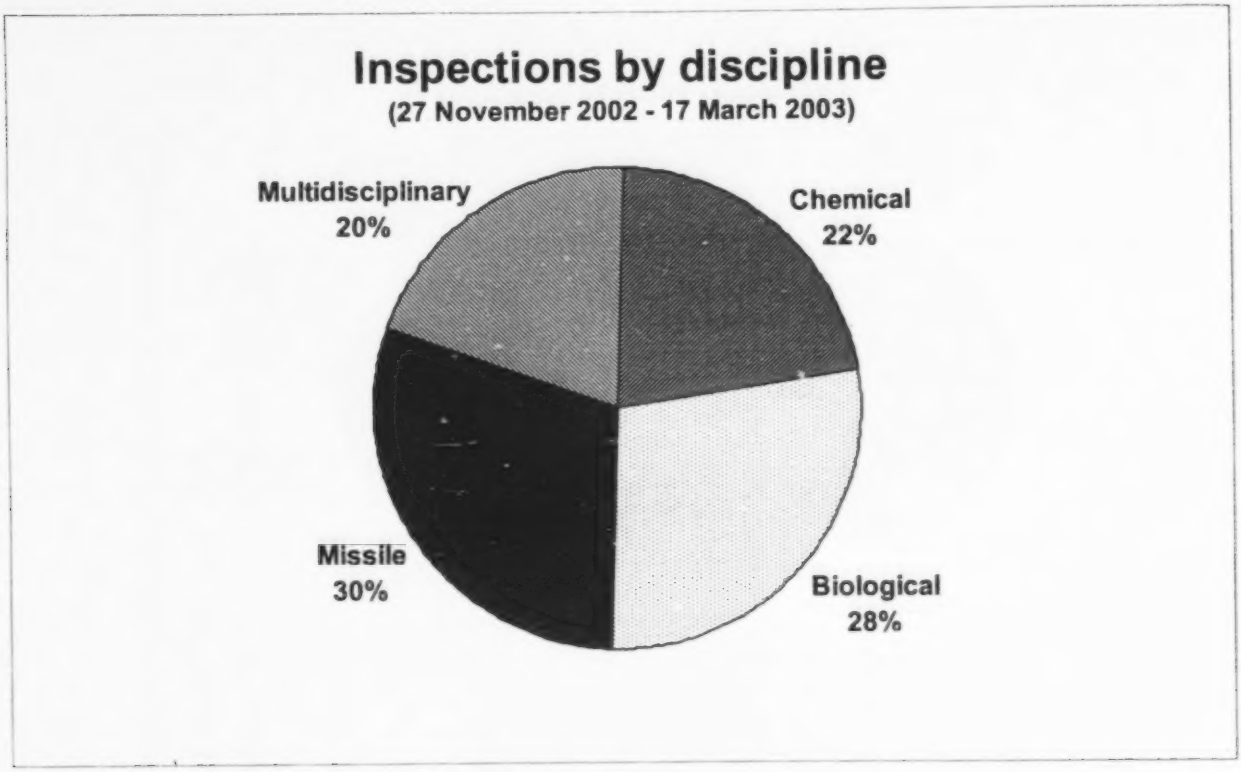
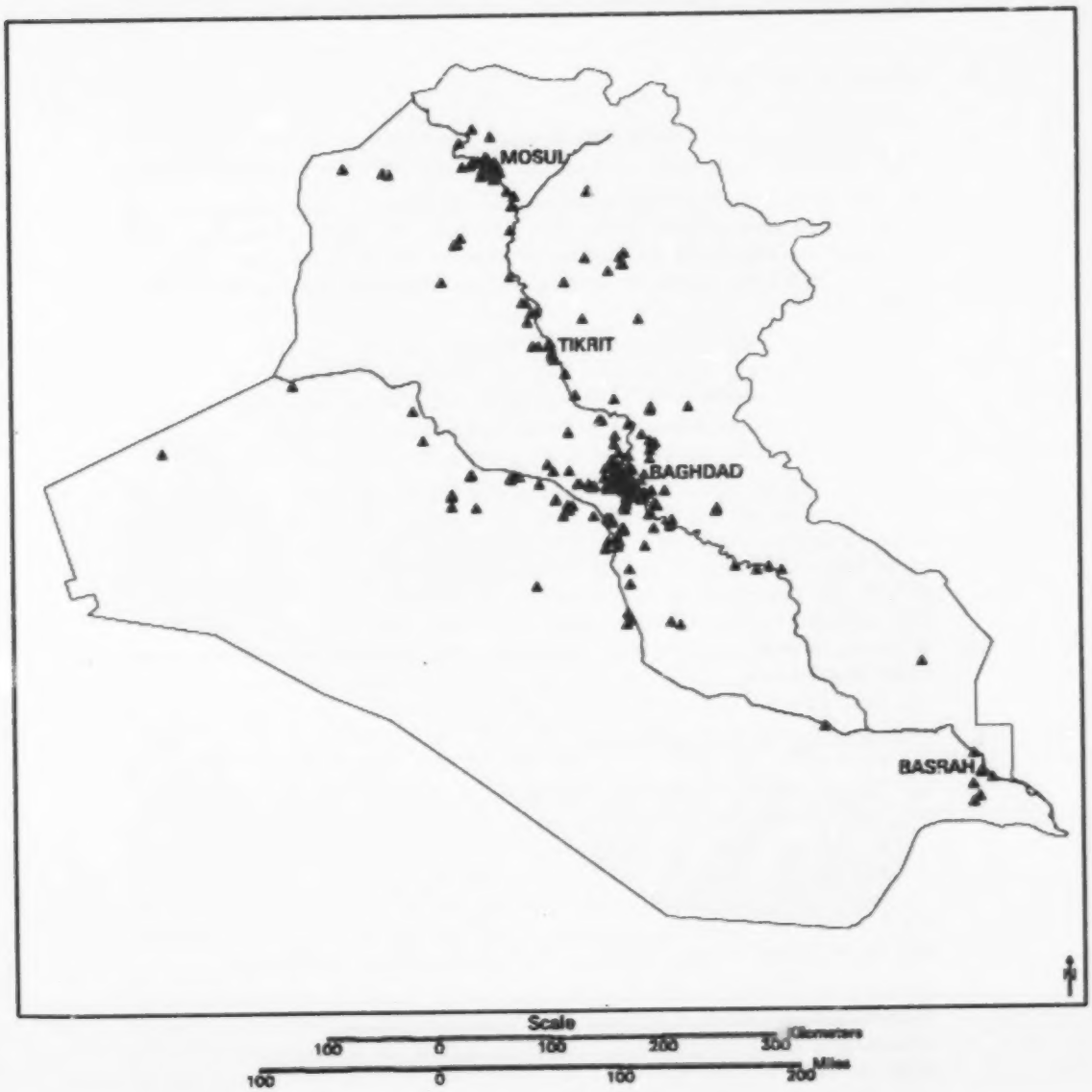

Inspections by discipline
(27 November 2002 - 17 March 2003)
Multidisciplinary
20%
Chemical
22%
Missile
30%
Biological
28%

Figure IV

UNMOVIC Inspected Sites



24. During the same period, the chemical laboratory was brought up to its full capacity and there was an increase in the number and quality of samples analysed. A large number of on-site analyses, such as alloys identification, were carried out. In addition, the planning process started for the future use of the laboratory for monitoring.

D. Missile inspections

25. Inspections in the missile area involved key missile production and research and development sites.

26. For the first weeks of missile inspections, the focus was on checking, tagging and re-tagging of equipment, particularly of the Al Samoud, Al Fatah, SA-2 and Frog missiles. In addition, inspections were carried out of all static test stands for both solid and liquid propellant rockets, and one flight test of a modified missile was monitored.

27. Later in the inspection period, while tagging activities continued, inspections concentrated on four areas: known sites that had not yet been visited; sites for assessing Iraq's capability in missile guidance and control; assessment of Iraq's capability in solid propellant rocket technology; and assessments of sites for the most effective way of implementing future ongoing monitoring and verification.

28. Following the UNMOVIC conclusion that the Al Samoud 2 missile and two previously destroyed but refurbished casting chambers were prohibited, Iraq was requested to present those items for destruction. Most inspections carried out during March involved making an inventory of related items and observing the destruction activity. The destruction of all items of the Al Samoud 2 missile system was not fully completed until 18 March 2003. In addition, inspections were carried out following the release by Iraq of items and materials connected to indigenous Scud engine manufacture.

E. Multidisciplinary inspections

29. Multidisciplinary inspections were performed at many different types of site. However, the emphasis was on non-chemical, biological and missile sites, such as central customs offices; engineering companies and military nuclear, biological and chemical defence facilities; military vehicles design and construction sites; presidential sites; and private homes. The regional office in Mosul served as an important base for conducting inspections in northern Iraq that otherwise could have been visited only after long road trips or utilizing air-transport capabilities.

30. Inspection of ammunition storage areas was an important part of the work of multidisciplinary teams throughout the inspection period. Munitions experts, utilizing both visual recognition techniques and appropriate detectors, conducted in-depth searches of munitions production, storage and disposal areas, which resulted in the detection of (empty) munitions that might have gone unnoticed if the searches had relied solely or primarily on technical means to detect toxic or infectious material.

31. A further aspect of the multidisciplinary team's activities was the support provided by explosive ordnance disposal specialists to the other disciplines. Those

specialists performed a vital safety function at many military sites and, when needed, provided expertise for all munitions-related inspections, drilling and sampling.

32. Lastly, a number of sites were inspected by the multidisciplinary teams following information provided by Governments or derived from open sources.

F. General operational issues

1. Implementation of the multidisciplinary approach to inspections

33. As recommended in the Amorim panel report (see S/1999/356, para. 40), a multidisciplinary approach to inspections was established for UNMOVIC field operations. Inspection teams, consisting of experts with different scientific backgrounds, were set up, which allowed the conduct of competent inspections at sites with multiple activities. As a result, a more complete understanding of the sites was developed since it was possible to obtain, in addition to information ascertained under a specific discipline, complementary information about procurement, contracts and relationships with other companies and national and foreign suppliers.

2. Guidelines

34. UNMOVIC operations and activities have been guided by the relevant Security Council resolutions and other basic documents. In addition, there have been detailed internal procedures, guidelines and policy documents, including an administrative manual, a glossary, a draft handbook and guidelines for health and safety during operations in Iraq; the latter two documents were particularly relevant during inspections.

35. The draft UNMOVIC handbook is divided into three parts. Part I covers all aspects of UNMOVIC operations and activities, inter alia, inspection and reinforced ongoing monitoring; aerial surveillance; transportation; accommodation; UNMOVIC rights and responsibilities; relations with the media; and Iraq's obligations. Part II contains discipline-specific procedures as well as policy documents on, inter alia, sampling and analysis of chemical and biological weapons agents; sampling of solid propellants and their ingredients; tagging of missiles; and disposition of prohibited items or unidentified dual-use items. Part III contains the texts of relevant governing resolutions and related legal instruments. The draft handbook was initially presented to the UNMOVIC College of Commissioners in February 2001; it was completed taking into account the Commissioner's comments. UNMOVIC has been guided by the provisions of the draft handbook in its activities. The draft handbook was also used as a reference basis during the talks (July and September/October 2002) held between UNMOVIC, IAEA and the Government of Iraq on the practical arrangements related to the resumptions of inspections in Iraq, and material contained in the draft handbook has been used in UNMOVIC training courses. The draft handbook was revised and updated on 6 December 2002 to take into account the provisions of resolution 1441 (2002) and its annex. The latest revision was made on 11 March 2003 to incorporate practice developed during inspection activities.

36. The UNMOVIC administrative manual, issued by the Chairman in November 2001, is a compendium of administrative rules and procedures covering, inter alia,

communications and records, personnel matters and management of confidentiality. As a supplementary document to United Nations established rules, the manual was intended to guide UNMOVIC personnel in the discharge of their responsibilities.

3. Establishment of a regional office in Mosul

37. In December 2002, it was decided to establish a regional office in the north of Iraq in the city of Mosul to be operated by a multidisciplinary team of inspectors.

38. Offices were established in the Ninevah Palace Hotel in Mosul. The first inspection by the Mosul team was conducted on 5 January 2003, the day after the team's arrival. The office continued its operations until 17 March 2003. The Iraqi Government also established a regional branch of its National Monitoring Directorate in Mosul to support UNMOVIC activities in the northern region of the country.

39. Operating a regional office provided several advantages, such as increased number and efficiency of inspections due to the relatively short travel distances thereby obtained to a significant number of sites in northern Iraq, and increased effectiveness, including the attainment of unannounced access to sites.

4. Air operations

Logistics support

40. The Commission's aerial assets were an important part of the mission. Various aircraft were used for the transport of personnel and equipment as well as for aerial surveillance over Iraq. The Commission had one L-100 transport aircraft based in Baghdad to provide an air bridge to Larnaca, the site of the Commission's field office in Cyprus. From November 2002 until 18 March 2003, about 550 hours were flown by that aircraft, during which it carried 1,254 passengers and 332 tons of cargo. The Commission also operated five Bell 212 and three MI-8 helicopters. These were based at the Rasheed Airbase in Baghdad, where an aerial operations office was established. The first helicopter flight for inspection purposes took place on 7 January 2003. The helicopters provided transport for inspectors and equipment throughout Iraq. Helicopter operations took place from late December 2002 until March 2003. During that period, the helicopters logged 377 flight hours and carried 1,058 passengers and 5.8 tons of equipment. The combined aircrews and related support staff comprised 57 persons.

Surveillance

41. Aerial surveillance in support of ground operations and monitoring of activities at distant sites was carried out after operations procedures and security in the no-fly zones was agreed upon with the United States and Iraqi authorities. A Bell 212 helicopter equipped for the acquisition of aerial imagery and night flight was used for surveillance. The equipment consisted of a cockpit-installed infrared system plus a standard video camera. That technique was also used to identify, by direct observation, new sites to be inspected. Eight aerial surveillance/monitoring missions were carried out.

42. The United States and France supported the Commission through the provision of high-altitude U2 and medium-altitude Mirage IV surveillance aircraft. Iraq raised

some security questions that resulted in delays in the start of those operations. Those questions were resolved on 10 February and operation of the U2 and the Mirage IV commenced on 17 and 26 February 2003, respectively. In total, 16 reconnaissance flights were made until the middle of March 2003, eight by the U2 and eight by the Mirage IV.

43. Discussions with the Governments of Germany and the Russian Federation on the provision of unmanned aerial vehicles and AN-30 surveillance aircraft were under way and the deployment of those aircraft had not yet begun when the inspectors withdrew from Iraq. The Commission remains grateful to all Governments that supported or were ready to support its air operations.

5. Overhead imagery

44. UNMOVIC photographic interpreters processed and analysed imagery in support of the UNMOVIC mandate. The imagery was obtained from a number of different sources, including commercial satellites and Mirage IV and U2 aircraft. While inspections were under way, overhead imagery and other imagery-derived products, such as maps and line diagrams, were provided in hard copy and digital format to the Division of Planning and Operations. The different aerial platforms were in turn tasked to collect imagery of specific sites and areas in response to UNMOVIC requirements. Extensive use was made of imagery to research sites given by intelligence. It is notable that during the period after UNMOVIC's creation, technological advances have greatly improved timely access to good quality overhead satellite imagery. Timely access to the imagery acquired through the Mirage IV and U2 aircraft has also improved greatly with the enhancement of communication capabilities.

6. Interviews and lists of Iraqi personnel

45. During the period 1 to 17 March 2003, UNMOVIC made 15 requests for interviews with Iraqi scientists, bringing the total number of requests since January 2003 to 54. During that short period, nine interviews were actually conducted, the last one on 17 March, bringing the total number of interviews in all disciplines to 14. All interviews were conducted under UNMOVIC procedures and format: there were no witnesses, recording or videotaping and interviews were conducted in locations selected by UNMOVIC.

46. Interviewees were selected on the basis of UNMOVIC analysis of Iraqi chemical and biological weapons and missile programmes and using lists of personnel provided by Iraq. Seven chemical, six biological and one missile-related interviews were conducted. The individuals included both decision-making staff and scientific, engineering and technical personnel. Interviews were subject-oriented, addressing such issues as specific types of chemical or biological production, chemical precursors or unilateral destruction operations. Information obtained during interviews was found useful and led in some cases to an updating of the assessments contained in the Commission's list of unresolved disarmament issues.

47. It should be noted that the above-mentioned process of formal interviews was pursued in addition to the discussions that frequently took place with the Iraqi managers and relevant technical staff at inspection sites.

48. Iraq provided 31 separate lists of names, which were attached to 10 different letters pertaining to all aspects of its weapons of mass destruction programmes, the last dated 17 March 2003. Regarding the names associated with unilateral destruction of prohibited materials, two of the lists gave the names of experts involved in the handling and destruction of missile and chemical equipment and materials, and three included the names of personnel associated with the unilateral destruction of biological weapons and agents. The amount of information provided in those letters that was not included in previous declarations varied according to weapons disciplines.

Chemical

49. A list related to the unilateral destruction of chemical munitions during the summer of 1991 contained 83 names of experts involved in the destruction of empty aerial bombs, empty 122 mm munitions, R-400 aerial bombs, choline and alcohol-filled al-Hussein missile warheads. Most of the names were of high-level scientists and military officers. Many of the persons named were previously unknown to UNMOVIC or at least not known to have been involved in unilateral destruction actions. For instance, in the letter dated 17 March 2003, the names of two persons involved in the drafting of the so-called air force document were mentioned.

Missiles

50. The information provided contains the names of 63 persons associated with the destruction of missiles and missile-related items, presumably the Scud-type missiles, engines, warheads and other equipment and components Iraq declared it had unilaterally destroyed during the summer of 1991.

Biological

51. A letter dated 17 March 2003 contained the names of 215 persons associated with biological weapons. All but two of the names had been submitted to UNMOVIC in previous letters. Those lists did, however, add some significant details, in that whereas the original lists appeared to be simply a list of names ordered chronologically according to when a person joined the programme, the new lists were structured along the organizational lines that UNMOVIC had originally requested. Among the 215 names provided, six were associated with the destruction of munitions, six with the destruction of warheads, two with the destruction of R-400 gravity bombs and 19 with the destruction of biological agents. There was, however, considerable duplication of names since a number of people worked in multiple fields.

* * *

52. In view of Iraq's claim that no documents existed concerning its unilateral destruction of prohibited materials and in view of the importance that such destruction has for the accounting of biological and chemical weapons, interviews with persons on the above-mentioned lists might have provided significant information.

G. Integration of advanced technologies for inspection

53. In addition to the portable chemical and biological detectors for in situ direct determination of traces of chemical and biological agents, UNMOVIC inspectors had at their disposal advanced geophysical equipment for the search of hidden structures and storage spaces that could be used for hiding precursors, agents or weapons of mass destruction. Of special interest was the capability of those advanced technologies to detect concealed spaces and passages that could be used for storage, laboratories or production facilities nearby or under large buildings, such as factories, hospitals and military installations. In order to be more effective, combinations of techniques were used according to site characteristics. The techniques available are described below.

1. Ground-penetrating radar

54. Ground-penetrating radar surveys detect the disturbance in the pattern of high-frequency electromagnetic waves in the ground caused by hidden structures, such as buried pipes, hidden shafts, buried materials, different porosity and soil densities. Surveys are easily and rapidly run. They provide visual data display in real time, which is important for on-the-spot decisions whether or not to excavate. The depth capability of the system is up to 15 to 20 m, depending on the frequency of the antenna used.

2. Electromagnetic induction soil change mapping

55. Electromagnetic induction responds to changes in the electrical resistivity of the ground. It is useful for mapping changes in the thickness of overlying material, thereby pointing to suspicious areas where local soil has been replaced by more resistive material, such as concealed structures.

3. Computer and server forensics

56. Information contained in hard disks and servers at inspected facilities and government offices may help to identify the kind of activities which are pursued and connections with suppliers of materials or services. It may also be helpful to find documents pertaining to projects, organization, finances and personnel. Specific software and hardware was purchased to seek such information, and three experts in computer forensics were part of the multidisciplinary support team deployed in Iraq.

4. Remote drilling and sampling systems for munitions

57. Munitions opening for neutralization and identification of chemical agents is currently the most advanced technology available for sampling hazardous liquids, such as chemical or biological agents, in munitions. It allows inspectors to drill safely into a munition, extract a sample of liquid contents and, when appropriate, drain the contents for subsequent destruction. It was successfully used to sample old 155 mm artillery shells containing mustard gas and biological material from excavated R-400 bombs.

III. Laboratories and sampling

58. UNMOVIC inspectors collected a total of 356 samples (254 chemical, 101 biological and one missile propellant) from a variety of sites. Laboratory analysis allowed inspectors to determine an industrial chemical's true identity, search for evidence of proscribed activities and verify the industrial or research activities associated with the samples taken. For additional examination, a small number of samples were sent to outside laboratories under contract with UNMOVIC. Those procedures gave UNMOVIC a credible means of checking inspection findings.

59. During the course of inspections, UNMOVIC laboratory staff began to establish an analysis regime to verify permissible industrial and research activities — an important step towards ongoing monitoring of Iraq's industry. Specifically, the analysis strategy had begun to change from looking for weapons of mass destruction-related compounds only to a monitoring regime in which UNMOVIC also looked for significant site activity changes.

60. UNMOVIC sample analysis methods were geared to detecting the smallest traces of chemical and biological agents. Inspectors at Iraqi sites screened the facilities for the presence of toxic chemicals in the air, using military safety equipment. Equipment was designed to detect only chemical agent vapours, however, and not chemical weapons precursors and degradation products or biological agents. Therefore, UNMOVIC inspectors adopted an approach of collecting solid, liquid and surface swipe samples for screening at BOMVIC. Trained personnel collected the samples, using strict chain-of-custody rules to maintain sample integrity. Using those procedures, UNMOVIC was able to detect the widest spectrum of chemical and biological weapons-related compounds long after any possible agents had been present on-site.

61. Iraqi declarations concerning material were in all cases verified by UNMOVIC sample-screening procedures. Declarations by Iraq on munitions said to contain chemical or inactivated biological agents were consistent with verification results. Investigative samples taken in search of undeclared proscribed activities revealed no such activities.

A. Chemical laboratory

62. The chemical laboratory at BOMVIC employed a number of steps for screening samples, as set out below.

On-site

63. Infrared spectroscopy (total attenuated reflectance-fourier transform infrared): this technique allows the analysis of pure solids and liquids, such as industrial feedstocks, for absolute qualitative identification of approximately 10,000 different chemical compounds, including relatively pure samples of all chemical agent precursors and degradation compounds.

64. Vapour-inlet/headspace gas chromatography/mass spectrometry: this technique tests for volatile chemicals found in environmental or industrial samples.

65. X-ray fluorescence: this technique allows the verification of the alloy composition of potential dual-use metal parts.

At the laboratory

66. Gas chromatography/mass spectrometry: organic and/or aqueous extracts of samples were tested qualitatively for the G- and V-class nerve agents and for the blister agents lewisite and mustard gas. When necessary, those compounds could also be measured quantitatively using a validated method, with triethylphosphate as a standard. Precursors and degradation products of those agents (and many thousands of other compounds) could be detected qualitatively either by the direct injection of the extracts or by derivitization with silylating compounds.

67. Capillary electrophoresis: this technique was employed to quantitatively screen all samples for the primary degradation products of G- and V-class nerve agents. More than 95 per cent of the samples accepted by the UNMOVIC laboratory were screened by this technique.

68. Wet chemistry methods: as a part of UNMOVIC plans to monitor Iraq's activities in the chemical area, inspectors intended to establish sensitive wet chemical analytical methods to quantitatively detect hydrofluoric acid, cyanides, iodine and the components of liquid missile fuels.

69. The distribution of samples collected and analysed was as follows:

Chemical analysis performed on samples
(27 November 2002-17 March 2003)

Type of sample	*Number collected*
Stored chemicals	16
Reaction liquor	41
Equipment	83
Mustard gas	14
Ammunition	33
Infrastructure	53
Environmental	14
Total	**254**

B. Biological laboratory

70. The biological laboratory at BOMVIC performed initial screening of samples taken during inspection looking for undeclared activities involving biological threat agents. Sampling and screening procedures at BOMVIC were operational throughout the inspection period.

71. A total of 101 samples were taken from 17 sites. Some samples were taken for positive verification from universities, research and development or vaccine-producing facilities; others were taken to explore munitions fillings or residues, or to investigate whether undeclared activities with biological threat agents had been undertaken. The distribution of samples was as follows:

Distribution of biological samples
(27 November 2002-17 March 2003)

Type of sample	*Number collected*
Munitions fillings	40
Research and development and universities	10
Vaccines and food industries	41
Quality control laboratories	10
Total	**101**

72. The biological laboratory at BOMVIC used a number of assays for screening, as set out below.

73. Rapid polymerase chain reaction assays enabled testing for the biological threat agents *Clostridium botulinum*, *Bacillus anthracis*, *Brucella sp.*, *Francisella tularensis* and *Yersinia pestis*. In early March 2003, the laboratory capability was expanded to include assays for the food poisoning micro-organisms *Salmonella spp.* and *E. Coli* O157:H7.

74. Immunological test cartridges enabled detection of the toxins ricin, botulinum toxin A and SEB toxin, and the biological threat agents *B. anthracis*, *Y. pestis* and *F. tularensis*. Early in March 2003, the biological laboratory also obtained test cartridges to screen for orthopox viruses.

75. Enzyme-linked immunosorbent assays allowed screening for botulinum toxin (high sensitivity) and the biological threat agents *B. anthracis*, *Cl. botulinum toxin A* and *B*, *Cl. botulinum toxin E*, *Y. pestis*, *F. tularensis*, *Brucella spp.*, ricin, SEB, SEA and SEC, and orthopox viruses, including camel pox.

76. Of the 101 samples taken, 82 were screened at the biological laboratory at BOMVIC. In addition, 10 samples were screened for the chemical team and four for the multidisciplinary team. All those samples were taken from ammunitions. Altogether, a total of 354 test runs were performed. Screening results of the samples, taken for positive verification, confirmed Iraqi statements on those samples. The samples which were taken to investigate undeclared activities with biological threat agents revealed no undeclared or possible proscribed activities. Screening of munitions samples yielded similar negative results.

C. Analysis at laboratories outside Iraq

77. One sample of solid propellant was sent to an overseas laboratory to test and confirm the composition declared by Iraq for the solid propellant used in the Al Fatah rocket motor. The analysis confirmed Iraq's declaration.

78. Other analyses conducted outside Iraq on biological material recovered in Iraq are described in paragraphs 79 to 84 below.

IV. Findings through inspection and analysis

A. R-400 bombs

79. From 24 February to 16 March 2003, UNMOVIC biological teams carried out a series of inspections at Al Azziziyah firing range, located approximately 100 km south-east of Baghdad, in order to observe Iraqi efforts to recover R-400 bombs and bomb pieces that Iraq claimed that they had filled with biological agents and subsequently unilaterally destroyed in 1991.

80. Iraq made efforts to recover and account for the 157 R-400 bombs that it claimed were filled with biological agent and destroyed at Al Azziziyah firing range. Iraq began the excavation and recovery of R-400 bombs and pieces on 19 February; informed UNMOVIC on 22 February 2003, by letter, of initial findings; and supplied copies of videotapes taken during the period when inspectors were not present at the site.

81. Iraq provided a progress report on the excavation by a letter dated 25 February 2003. UNMOVIC personnel observed all excavation activity from 24 February until 16 March 2003. Many of the items examined, including the intact bombs, were excavated at the site between 19 and 23 February 2003. The level of corrosion and surface contamination of the fragments and the bombs indicated that those pieces must have been buried for a considerable time period and suggested that Iraq's claim was credible.

82. The recovered pieces were examined for identification markings. Samples were taken from base plates, from nosepieces with intact burster tube fittings and from intact but breached bombs. In addition, three intact bombs were drilled and samples of their contents taken for analysis; of those, two contained liquid while the third contained a clay-like material, probably due to the presence of an undetected breach in the casing. Where present, the bomb marking was in agreement with the information provided by Iraq, i.e., bilateral black paint stripes on nose cones, black paint stripes on body sections, black stencilled lettering "R-400" on a body section, large white circle with an Arabic letter in the centre. Some further work was suggested to distinguish the excavated R-400 bombs from similar conventional bombs, but that work could not be carried out before inspections were suspended.

83. The counting of base plates appears to provide the best way to clarify the number of bombs. However, because of the level of surface corrosion and the fact that in some items only the base plate rim was present, it was not possible to confirm the presence or absence of a black stripe on all those items.

84. The excavations made from 19 February to 16 March 2003 unearthed the following items: eight bombs, 96 base plates, 60 nose cones and many fragments of nose cones, tails and bomb bodies, accounting for a total of 104 R-400 bombs, in addition to the 24 R-400 type bombs excavated by UNSCOM. The total number of R-400 bombs accounted for at Al Azzizziyah is 128 (out of 157 declared destroyed).

85. Samples were obtained of the liquid contents of two R-400 bombs that were excavated by Iraq in February 2003 at Al Azzizziyah. The initial screening techniques for chemical or biological agents at BOMVIC gave negative results for all tested material. The biological tests were performed on the samples directly without pre-cleaning or concentration. Since the biological laboratory at BOMVIC

did not have the capability to concentrate nucleic acids or to clean the samples from the quenching effect of potassium permanganate and formic acid, the samples of the two R-400 bombs filled with liquid agent were tested in outside laboratories. The results of that analysis indicated that both bombs contained DNA of virulent *B. anthracis*. No evidence of chemical agents or degradation products was found, nor was any evidence found of *Cl. botulinum* DNA or toxin. Additional tests are being conducted to perform single nucleotide polymorphisms to compare the type of *B. anthracis* found in bombs to the type declared and weaponized by Iraq; results are pending. In addition, the laboratory confirmed the presence of high levels of manganese and formic acid. Those two elements are an indicative verification of Iraq's chemical inactivation, as declared, of bomb contents with potassium permanganate and formaldehyde.

B. Cluster munitions

86. UNMOVIC conducted a series of inspections in early February 2003 to explore previous development of cluster munitions for chemical or biological agents. The Al Noaman factory and facilities were the focus of those inspections due to their history of producing cluster munitions. During the inspections, information was obtained and hardware pertaining to cluster bombs and cluster warheads for rockets was found. Specifically, UNMOVIC inspectors found the body of a chemical or biological submunition for the CB 250 cluster bomb and a 540 mm warhead which could be used with chemical agent-filled submunitions. In addition, components and moulds for other cluster bombs and rocket warheads were examined.

87. Examination of those munitions revealed that most if not all were manufactured prior to 1991. No evidence was found that suggested that they were of more recent origin. A complete assessment of them would have required additional activity in Iraq, including interviews to explore Iraqi explanations of their history, purpose and functioning.

C. Warheads for rockets

88. The discovery by UNMOVIC of twelve 122 mm chemical warheads and rocket motors in mid-January 2003 at the Ukhaidar ammunitions depot led to an Iraqi declaration regarding four additional warheads at Al Taji a few days later. X-ray examination of those warheads at both locations showed that some contained an unknown liquid. Operations were undertaken to drill safely into the warheads and extract samples of the liquid contents for subsequent analysis. The contents were determined to be primarily water.

89. Other items were found that might be part of past programmes prohibited by the Council and would require further analysis, including various parts for 81 mm, 107 mm and 200 mm rocket warheads and other munitions. In addition, a small number of rocket warheads and artillery projectiles that appeared to be chemical weapons munitions were found filled with high explosives. Plans to analyse those components in greater detail were interrupted by the withdrawal of UNMOVIC from Iraq.

D. Remotely piloted vehicles and unmanned aerial vehicles

90. Iraq provided a letter dated 19 March 2003, containing additional information on the specifications of all types of unmanned aerial vehicles in its inventory, lists of personnel involved in the development of remotely piloted vehicles/unmanned aerial vehicles, flight test data and information related to the verification of its accounts of its MiG-21 unmanned aerial vehicles project. Iraq declared a number of unmanned aerial vehicles in its disclosure of 8 December 2002 and its semi-annual monitoring declarations, including a converted L-29 aircraft and other smaller remotely piloted vehicles with wingspans up to 5.52 m. Iraq declared and inspections have confirmed that unmanned aerial vehicles capable of autonomous flight were developed and produced. A remotely piloted vehicle with a wingspan of 7.45 m manufactured from an aircraft fuel tank was observed and examined during an inspection in early February. In a letter dated 18 February 2003, Iraq amended its January 2003 semi-annual monitoring declaration, stating that a mistake in the wingspan had been made (the letter gave the wingspan as 7.40 m and not 4.40 m, which had previously been declared). In addition, other inconsistencies were identified with regard to this unmanned aerial vehicle between Iraq's declaration and inspection findings. The significance of the inaccuracies and the incomplete declarations cannot now be determined because UNMOVIC was not able to fully investigate the unmanned aerial vehicles programme. Without further onsite access to the actual unmanned aerial vehicles and other material, it is not possible to determine whether Iraq had pursued the development of unmanned aerial vehicles for possible use in chemical and biological weapons dissemination and whether they were capable of ranges greater than 150 km or were designed for the legitimate purposes stated.

E. Scud engine components and ingots

91. Iraq provided two letters concerning Scud engine components. The first letter, dated 25 February 2003, related to the submission of indigenously produced Scud engine components for analysis abroad. The second letter, dated 13 March 2003, related to the presentation of ingots resulting from the unilateral destruction of components of the Scud-B reverse-engineering efforts in 1991/1992. For the Scud engine components declared to have been indigenously produced, a comparison with those obtained by UNSCOM for the imported Scud-B would possibly allow a determination of the quality of the production and whether they were in fact of indigenous origin. The components were inventoried and visually analysed by UNMOVIC experts. The remnants will need to be sent to laboratories for a comparative analysis with the imported Scud engines. As for the ingots, a large quantity, some 78 tons, was buried by Iraq at one of its missile facilities. Iraq had started excavating the ingots and UNMOVIC had started inventorying and photographing them on 15 March 2003. A selection of the ingots would need to be made since UNMOVIC is specifically interested in the melted remnants of the imported turbopumps, of the rejected combustion chamber/nozzle assembly and of the production tools. The results of the analysis might help resolve the issue of indigenous liquid-fuel engine production.

F. Iraq's anthrax destruction study

92. On 26 February 2003, Iraq submitted a report describing a study it had initiated to try and show, through scientific means, that it had indeed disposed of chemically inactivated *B. anthracis* (anthrax) agent, in the quantity it had declared, at the Al Hakam dump site in 1991.

93. On 1 March 2003, UNMOVIC and Iraqi experts discussed the report and the preliminary results of the analysis of soil from the dump site. On 19 March 2003, Iraq submitted another paper with more analytical results and indicated that it would attempt to perform a qualitative and quantitative chemical and biological analysis of soil samples taken in a defined grid pattern from an area of the dump site that had been identified by UNSCOM in 1996. In support, Iraq also provided a report on the geophysical characteristics of the sampling area. Given that 12 years had elapsed since the material was stated to have been disposed of, such information would be essential to properly interpret the analytical results.

94. The analytical methods applied were the chemical analysis of the mineral content and bacteriological content of the soil. The data provided to UNMOVIC from the relatively few samples for which the analyses had been completed at that time, when compared to those of the relevant background samples, indicated:

(a) A significantly higher concentration of manganese (Mn) and potassium oxide, which would support Iraq's explanation that it had chemically deactivated the agent by mixing it with potassium permanganate and disposing of the liquid at the dump site. That is also supported by the inverse relationship found between the number of spores and the amount of manganese in the samples;

(b) A significantly higher quantity of total organic carbon and total nucleic acids, i.e., biological material;

(c) The presence of an increased number of micro-organisms with bacteriological characteristics similar to *B. anthracis*. That bacteria would need further strain typing, which was not available in Iraq, to show whether they were identical to the *B. anthracis* strain used by Iraq for agent production or just genetically similar types of bacilli commonly found in the environment. It should be noted that analysis by an outside laboratory performed in 2002 on samples taken by UNSCOM from the same area using single nucleotide polymorphism analysis did reveal the presence of the strain of *B. anthracis* at the Al Hakam dump site.

95. While the analytical work performed by Iraq, in particular the observed qualitative and quantitative changes in mineral and biological characteristics in the soil samples, appeared to be consistent with Iraqi declarations, a number of problems existed:

(a) The study did not show conclusively that the environmental impact on the soil of the dumping sites and the resulting changes in mineral content were solely caused by dumping of the declared amount of chemically inactivated biological agents — 11,340 litres of agents and 303.6 kg of potassium permanganate;

(b) The dumping area had also been used by Al Hakam personnel to dump unsuccessful production batches in years prior to 1991, which would make it difficult to quantify only what was dumped in 1991.

96. Overall, UNMOVIC assessed that, given the length of time that had elapsed since the agent was stated to have been dumped, the study could not provide a quantification of the amount of anthrax dumped in 1991 with the necessary degree of certainty. For a final assessment of the matter of anthrax destruction at Al Hakam, information from other sources, such as interviews and documentary evidence, would be required. Although new information was acquired, that assessment did not resolve the question regarding the total quantity of anthrax produced and destroyed by Iraq.

G. Iraq's VX destruction study

97. Towards the end of UNMOVIC's last period of inspections, Iraq made considerable effort in terms of providing scientific data, documentation and further explanations to try and resolve the outstanding issues concerning VX and VX precursors.

98. Iraq provided nine letters on VX and its precursors choline, thionylchloride, phosphorous trichloride, phosphorous pentasulphide and di-isopropylamine. Sampling strategies for VX and choline in soil were outlined in a paper of 9 February and analysis results for VX were reported on 3 March 2003, one day after technical discussions between UNMOVIC and Iraqi experts on the issue were held in Baghdad.

99. A final report entitled "Estimation of VX degradation products in soil at the dump site in the Muthanna State Establishment", prepared by the Soil and Water Department of the Iraqi Atomic Energy Commission, was received by UNMOVIC on 15 March 2003. The report contained the sampling scheme for the VX "graveyard"; proposed degradation routes in soil for VX; analytical procedures; mass balance equations;. a report on VX quantification; and geological data. A similar report, entitled "Estimation of choline degradation products in soil at the Kasr Al-Ashig site", describing the experimental procedure and quantification of the immediate VX precursor choline, was received on 17 March 2003.

100. Based on quantifications of total organic carbon and nitrogen, the VX report concluded that between 30 per cent (carbon) and 39 per cent (nitrogen) of the 1.5 tons of dumped VX could be accounted for. However, if quantification was based on phosphorous the calculated recovery was 63 per cent. The absence of the remaining quantity was attributed to evaporation.

101. A number of scientific problems were identified with the study. For example, it would be reasonable to assume that background levels of all the elements quantified through the study existed. Without a proper understanding of those levels and their variations, the composition of the background could not be verified and quantified so that it could be accounted for in the analytical results. Experts consulted by UNMOVIC also questioned how well the total depth of the spill was covered by Iraq's sampling activity and whether an undisturbed sample core was collected. They stressed the need for background samples as well as the importance of sampling the correct granulometric fraction of the soil.

102. UNMOVIC pointed out to Iraq that the primary concern with regard to VX was not simply the quantity unilaterally destroyed in 1991 but rather the retention of precursors, know-how and the extent of the development of the programme in 1990.

Therefore, Iraq's sampling and quantification effort, even if successful, would not address all of the unresolved issues identified by UNMOVIC.

103. The study is, however, of interest and value for the information it provided on the geology of the soil at the site. That information would greatly assist any future sampling missions. Further exploitation of the site might also help to determine the stability of the destroyed VX, which is also an issue of concern. That would require an analysis of VX degradation products and a thorough characterization of the soil.

104. Iraq also made an effort to explain the outstanding quantities of precursors for VX. However, its proposal to quantify the amount of "Iraqi choline" unilaterally destroyed in 1991 had the same problems as the quantification of VX. The proposal from Iraq, as it stood, needed significant modification --- not the least of which was the requirement to try and quantify Iraqi choline itself at the dump site (the current Iraqi proposal was to quantify possible decomposition products of Iraqi choline). With modifications, it might be possible to gain some estimate of the quantities unilaterally destroyed, albeit with a considerable margin of error.

105. With respect to the other VX precursors, the new document given to UNMOVIC on phosphorous trichloride, in combination with results from interviews, might be helpful in resolving the accounting issue for that chemical. The information provided on thionyl chloride was not new and did not therefore change UNMOVIC's assessment that accounting issues remained concerning that chemical.

H. Mobile chemical and biological weapons production facilities

106. UNMOVIC has undertaken a variety of activities to investigate whether mobile chemical and biological weapons production facilities existed in Iraq. Those activities were prompted by a number of considerations, as set out below.

Information provided by supporting Governments on mobile facilities

107. UNMOVIC inspected a number of sites throughout Iraq based on intelligence information made available to it. In addition, other sites were inspected as a result of follow-up actions. Site inspections were aimed to investigate in detail the infrastructural signature necessary for the alleged function of such sites, e.g., the presence of suitable support services for chemical and biological weapons mobile production facilities during production runs. Inspection results and analysis of detailed forensic sampling of the facilities did not reveal evidence of any past involvement of those sites in proscribed chemical and biological weapons mobile production activities. At several of the inspected sites, sea containers with recently (United Nations-registered) imported seed-processing equipment, with some resemblance to production equipment, were present.

Information provided by Iraq on mobile facilities

108. In response to a request from UNMOVIC, Iraq provided two letters dated 5 and 15 March 2003. The first letter described the six different types of mobile facilities in Iraq's inventory, the second letter provided more details, with a list of 39 photographs and four videotapes. The photographs provided a reference base with which to judge the types of vehicle that could be converted to a mobile production facility without much difficulty. Iraq also provided details of two of the

manufacturers involved in the construction and modification of such trucks, the Al Majid State Company and the Al Fao State Engineering Company. Examination of the records of the two state companies identified by Iraq, as well as of other companies identified during inspections, could allow UNMOVIC to follow up any specific leads provided by supporting Governments. None of the types of mobile laboratories described in the media in April/May 2003 as found in Iraq matched the description of mobile facilities provided by Iraq to UNMOVIC.

Mobile facilities identified during inspections

109. During regular inspections, UNMOVIC identified a variety of mobile facilities at several sites. The outline and characteristics of those trucks were consistent with the declared purposes, e.g., mobile food-testing laboratories and cooled transport trucks. That was further supported by extensive forensic sampling of the interior and exterior of those trucks. No evidence of proscribed activities was observed during random checks of transport trucks. In addition, another state company, the Al Bashair Company, was found to have been involved in the legitimate acquisition of a mobile health laboratory.

I. Information on suppliers provided by Iraq

110. Iraq was required to declare the import of dual-use items and supply UNMOVIC with details as to their origin. However, Iraq's recent semi-annual monitoring declarations, starting with the "backlog" of declarations since 1998 supplied to UNMOVIC in October 2002, showed a trend of withholding pertinent information. The significance of the information withheld varied between the different weapons disciplines. It could be argued, for example, that the declared chemical imports would play only a very minor role in any potential chemical weapons programme since they consisted mostly of valves and diaphragms with only a moderate resistance to corrosion. The biological imports were of a slightly more significant kind, and included the import of a dozen autoclaves, half a dozen centrifuges and a number of laminar flow cabinets.

111. Missile imports, however, were more substantial and could have contributed significantly to any missile development programme. One example was the importation of 380 Volga engines that Iraq planned to use in the production of the Al Samoud 2 missile, a missile system UNMOVIC later determined to be prohibited since its range exceeded 150 km. In its declaration of 7 December 2002, Iraq declared that it had imported 131 such engines but failed to supply any information about their origin (suppliers, exporting countries) until inspectors observed 231 such engines at an Al Samoud production facility.

112. A trend that was especially pronounced in the missile area (but to a lesser extent also present in the biological and chemical fields) was the use of the term "local market" to classify the import of some very sophisticated pieces of equipment, including a dozen high-capacity load cells (used, for example, to measure the thrust of missile engines or motors) and a number of pieces of equipment that could be used in the manufacture of advanced missile motors. UNMOVIC came to understand that Iraq used the term "local market" when an Iraqi import company imported a commodity and then sold or transferred it to a

government facility, which suggested that Iraq was trying to conceal the extent of its import activities and to preserve its importing networks.

V. Destruction activities*

A. Al Samoud 2 missiles

113. Iraq provided information, inter alia, on its backlog of semi-annual monitoring declarations on its Al Samoud 2 missile programme. Some declared flight tests had exceeded 150 km in range, the limit set by the Security Council. In February 2003, UNMOVIC convened an international panel of experts which assessed that the missile was capable of exceeding the permitted range, while an assessment in the case of the Al Fatah missile could not be made, pending additional information from Iraq. Subsequently, UNMOVIC informed Iraq that under Security Council resolution 687 (1991) it was a proscribed system and accordingly should be destroyed. The Executive Chairman conveyed that decision to Iraq in a letter dated 21 February 2003 (which was also shared with Council members). Iraq accepted that decision, and destruction of the missiles and associated items commenced on 1 March 2003 under UNMOVIC supervision. Destruction activities continued up to 17 March 2003. All required destruction had not been completed by that time.

114. The destruction of the missiles and other major components took place on the site of the Taji technical battalion, located inside the Taji military camp, about 30 km north of Baghdad. The Al Samoud 2 missiles, warheads, launchers, command and control vehicles and other major components of missiles in production were prepared by the Iraqis and brought daily to that site for destruction under the supervision of UNMOVIC inspectors. Each item was crushed with a heavy bulldozer, then placed in nearby pits and covered with concrete. In the case of the launchers, only the launch tables and missile cradles, which were specific to the Al Samoud 2, were destroyed; the basic vehicles were not destroyed. For the command and control vehicles, only the software relating to Al Samoud 2 was destroyed. Details of the items presented each day for destruction were recorded by the inspectors, including serial numbers and any UNMOVIC tags and seals that had previously been applied. Photographs were taken of items before and after destruction, and also of the pits containing the remnants. The total number of Al Samoud 2 missiles is based on Iraq's statements and is consistent with documentary evidence provided by Iraq and with inspectors' findings.

115. As of 17 March 2003, two thirds of the Al Samoud 2 missiles declared by Iraq to have been deployed had been destroyed, as well as one third of the associated logistics and support equipment. A summary of the balance of Al Samoud 2 missiles and associated equipment as of 17 March is as follows:

* For a description of the material destroyed in the period 1991 to 1998, see appendix I.

Balance of declared Al Samoud 2 missiles and associated equipment

Item	*Inventoried to be destroyed*	*Destroyed 1-17 March 2003*	*Remaining to be destroyed*
Missiles deployed	75	50	25
Training missiles	16	16	0
Missiles in final assembly	6	6	0
Warheads deployed	70	32	38
Training warheads	16	16	0
Warheads in final assembly	6	6	0
Warheads in manufacture	20	20	0
Launchers	9	3	6
Command and control vehicles	9	3	6
Engines	331	5	326

116. In accordance with the Commission's instructions, Al Samoud 2 production had been frozen at all sites known to be involved in the programme, and while destruction was occurring at Al Taji, teams of inspectors visited those sites for the verification and destruction of associated items, including drawings, production fixtures and manufactured parts. That process had been completed at Al Wazariyah, Al Samoud Factory and Al Fatah Factory by 18 March 2003 but had not yet commenced at Al Khadimiyah, Al Qudis and Al Fedaa Hydraulic Factory. No liquid propellant had been presented for destruction.

117. On 8 March 2003, Iraq presented to UNMOVIC for its assessment a conceptual design for a new missile to replace the Al Samoud 2. The new design was similar to the Al Samoud 2 but incorporated changes that Iraq believed would make the missile conform to the 150 km range limit set by Security Council resolution 687 (1991).

B. Propellant casting chambers

118. During an inspection on 7 January 2003 of the Al Mamoun site, UNMOVIC inspectors observed two large propellant casting chambers. Iraq declared that those casting chambers had originally been acquired for the Badr 2000 project. That was a proscribed project, and although UNSCOM had supervised the destruction of the two casting chambers in 1991 Iraq had managed to refurbish them for use in their current solid propellant missile projects. Iraq had shortened the chambers' length in the process, but nonetheless the international panel of experts convened by UNMOVIC in February 2003 concluded that they could still be used to produce rocket motors for missiles capable of ranges greater than 150 km. UNMOVIC informed Iraq that the casting chambers remained proscribed and were to be destroyed. The destruction was carried out under UNMOVIC supervision from 1 to 6 March 2003. It was achieved by cutting each into at least 16 pieces and burying the remnants in a pit which was then filled with concrete.

C. 155 mm shells filled with mustard gas

119. The destruction of the chemical weapons agent mustard gas, which had started at the end of February, was completed in March 2003. Under UNMOVIC supervision, Iraq destroyed the 155 mm shells and the mustard gas contained in them. The shells found in 1997 were stored at a declared location — the former Muthanna State Establishment. In total, there were 14 shells, containing approximately 49 litres of the agent — four of them had been earlier emptied and sampled by UNSCOM. The agent was destroyed by chemical reaction and the empty shells with explosives. Samples taken from the shells showed that mustard gas produced over 15 years ago was still of high quality — 97 per cent purity.

120. All samples of mustard gas stored in the Commission's chemical laboratory were also destroyed the day before withdrawal of staff and no quantity of the live agent was left behind in the BOMVIC's offices.

D. Thiodiglycol

121. A small quantity of thiodiglycol (500 ml) was destroyed under UNMOVIC supervision in January 2003. That prohibited mustard gas precursor was found at the Al Basil Jadriya complex along with some other dual-use chemicals (also of laboratory quantity) by the chemical inspection team. According to the Iraqi site representatives, the chemical had been left over by a previous occupant of the site — the Scientific Research Center — and had not been used by the Al Basil complex for any purpose. The entire quantity of the chemical was destroyed on-site by chemical reaction and combustion. Inspection activities following the finding did not reveal evidence of any research being done at the site regarding the chemical agent mustard gas or the precursor itself.

E. 122 mm chemical warheads

122. An UNMOVIC inspection team found 12 undeclared 122 mm chemical warheads and motors at the Al Ukhaidar ammunition depot (11 of them were unfilled and 1 filled with water). Iraq notified the Commission on 20 January 2003 that four more warheads had been found at the Al Taji ammunition depot. In February 2003, an UNMOVIC team discovered an additional two undeclared 122 mm chemical warheads at the same depot (one of the six warheads discovered at the Al Taji depot was filled with liquid that was subsequently identified as water). In total, 18 chemical warheads were tagged by UMOVIC for destruction.

F. Chemical equipment

123. In its submission of the backlog of semi-annual declarations in October 2002, Iraq declared that it had transferred one piece of equipment, previously destroyed in 1997, from the storage area to the phenol factory of Fallujah II. It further declared that five other items of proscribed equipment from the former Al Muthana weapons plants had been installed in the military factory Al Qaa Qaa. In its declaration of 7 December 2002, Iraq had declared that an additional piece of destroyed equipment (a heat exchanger) had been installed in the chlorine factory of Fallujah II.

Following technical discussions on 9 February 2003, Iraq submitted a letter to UNMOVIC explaining the use of destroyed equipment in Fallujah II and declared that a third piece of previously destroyed equipment had been installed at the phenol factory (a pump). UNMOVIC conducted inspections to verify the declarations and clarify the issue. It decided that Iraq should destroy those three pieces of equipment at Al Fallujah II and five pieces of equipment at Al Qaa Qaa under UNMOVIC supervision. However, that destruction was not carried out prior to the withdrawal of the inspectors.

G. Destruction of biological material

124. The biological team observed and verified the destruction of 244.6 kg of declared but expired growth media. The biological team also observed and verified the destruction of 40 vials of expired toxin standards, with original seals, used in food testing and analysis. In both cases, the Iraqi authorities initiated the destruction request.

VI. Withdrawal of UNMOVIC from Iraq

125. On the evening of 16 March 2003, following a United States warning to the United Nations to withdraw its personnel from Iraq, UNMOVIC informed BOMVIC of the likelihood of withdrawal. It instructed personnel that certain preparatory activities should be initiated, taking into consideration the eight-hour time difference between Iraq and New York.

126. On 17 March 2003, limited inspections were conducted, as well as a planned interview, while BOMVIC staff started packing non-essential equipment, shredding documents, clearing desks and safes, and selecting records and equipment for evacuation. In the evening (local Baghdad time), the withdrawal instruction was given following the meeting of the Security Council at which the Secretary-General informed the members of his decision to withdraw and suspend all United Nations operations in Iraq. The withdrawal was to take place by air from Baghdad to Larnaca the next day,18 March 2003.

127. Overnight, the hard drives of computers were erased and all network drives were disconnected from the secure local area network for removal from Iraq. A number of servers were also packed as well as communication equipment, such as satellite and secure telephones. Sensitive documents were also prepared for removal.

128. On 18 March 2003, the BOMVIC offices were locked and sealed, including the offices at the Al Rasheed airbase where the Commission had stationed its helicopters. All UNMOVIC vehicles were parked inside the United Nations Canal Hotel compound. The move of UNMOVIC personnel from the Mosul regional office to Baghdad was completed in the morning and all 111 UNMOVIC and IAEA staff, together with other United Nations staff, were evacuated in a highly organized way to Larnaca, using three flights. Concurrent with that withdrawal, the three MI-8 helicopters, with all crew members, flew to the Syrian Arab Republic. The five Bell 212 helicopters and their crew had been withdrawn by their companies on 16 March, also via the Syrian Arab Republic. The Iraqi authorities were helpful during the withdrawal.

129. The UNMOVIC staff remained for a few days in Larnaca to finalize inspection reports and working papers and complete inventories. The administrative and logistics tasks associated with the repatriation of staff were initiated, and by 29 March 2003 most of the staff had been repatriated.

A. Status of Cyprus field office

130. The Cyprus field office has reduced its staff to three international staff and five local staff, and has closed out the financial accounts for Larnaca and Baghdad. The staff has organized the equipment brought out from Iraq during the withdrawal. In addition, several surveillance units are being kept in Larnaca, which UNMOVIC intended to install at Iraqi facilities for monitoring purposes.

B. Status of Bahrain field office

131. Although the Government of Bahrain had extended the 1991 agreement for UNMOVIC to use the field office in Bahrain to support inspection operations, UNMOVIC staged all its activities through Larnaca in Cyprus. Before the expiration of the current agreement with the Government of Bahrain on 18 May 2003, UNMOVIC obtained the Government's confirmation that the agreement would be extended on a month-to-month basis. Two local employees are maintaining the office.

VII. Other issues

A. Declassification of the "clusters" document

132. As mentioned in previous quarterly reports, the Commission had been preparing an internal working document of clusters of unresolved disarmament issues as part of the process under paragraph 7 of resolution 1284 (1999), to identify key remaining disarmament tasks for Iraq to complete.

133. The first stage of the process had been the creation of an inventory of all unresolved disarmament issues. In the identification of those issues, a number of sources, such as the UNSCOM (S/1999/94) and Amorim (S/1999/356) reports, UNSCOM inspection reports and various declarations and documents of Iraq, including those from the Haidar Farm, were consulted. For the period from the establishment of UNMOVIC until the resumption of inspections in November 2002, reliance had to be placed on such sources as overhead imagery, published material, suppliers and intelligence. Account was subsequently taken of the information supplied by Iraq in its declaration of 7 December 2002 and other documents it provided prior to and after the resumption of inspections. The results of those inspections and UNMOVIC's re-baselining activities constituted another important source of information.

134. The working document with clusters of UDIs had been designed to combine individual unresolved disarmament issues already identified so as to assess their interrelationships and significance. The document was submitted to the College of Commissioners in February 2003 for its comment and revised accordingly.

135. In response to requests from several members of the Security Council, the document was declassified and made available on 6 March 2003.

B. Draft work programme

136. In paragraph 7 of its resolution 1284 (1999), the Security Council required UNMOVIC to draw up a work programme for the discharge of its mandate. The work programme was to be submitted for the approval of the Council and to describe how the Commission intended to implement the reinforced system of ongoing monitoring and verification, and to present the list of key remaining disarmament tasks to be completed by Iraq.

137. The terms of resolution 1284 (1999) gave UNMOVIC up to 60 days after the start of work to prepare the draft work programme. In response to a request by several Council members, UNMOVIC agreed to submit the draft work programme before the deadline. Prior to the submission of the draft work programme to the Council, the draft was sent to the members of the College of Commissioners for their comments and advice. Taking into account the comments of the College, the draft was revised and then sent to the Security Council on 17 March 2003. A copy was also provided to Iraq. On 19 March 2003, the Chairman provided the Security Council with an oral briefing on the work programme. Since armed activities were initiated in Iraq on 19 March and UNMOVIC inspections were suspended, the Council took no action on the draft work programme.

C. Staffing

138. Since the suspension of activities in Iraq, all UNMOVIC inspectors and support staff who had been in Iraq have been repatriated. As at the end of May 2003, 90 of those staff remain under UNMOVIC contracts that are due to expire in early/mid-June 2003. UNMOVIC core staff in the Professional grades at Headquarters comprise 76 persons (of 31 nationalities); 14 members of the staff are women.

139. Regrettably, in March 2003, an inspector, Jian Xing Yu (China), died as a result of injuries sustained in a vehicle accident. The Commission extends its condolences to the family of Mr. Yu.

D. Training

140. UNMOVIC conducted two training courses during March and April 2003. One multidisciplinary course on the inspection and monitoring of dual-use production equipment in the biological and chemical areas was held in New York from 13 to 21 March 2003; there were 13 participants from nine countries. The second course, devoted to monitoring the non-production of biological warfare agents at civilian facilities, was conducted in Brazil from 31 March to 11 April; there were 10 participants from nine countries. The Commission is grateful to the Government of Brazil for its support of UNMOVIC training activities.

141. UNMOVIC started its training activities for its inspectors in Iraq in July 2000, since when it has conducted seven basic training courses. The total number of

persons trained through those courses is 380. UNMOVIC has also conducted 15 follow-up training courses for personnel who completed a basic training course; more than 250 participants have attended follow-up courses, which were devoted mostly to the development of practical inspection skills and inspectors' abilities to monitor dual-use materials and equipment in Iraq. Throughout the process, the views of course participants were surveyed and the scope and content of the training courses adjusted. The current composition of the roster (354 persons from 55 countries) is provided in detail in appendix II.

E. Export/import

142. From the period 1 March 2003 to 22 May 2003, UNMOVIC received from the Office of the Iraq Programme 1,814 contracts under the Oil for Food Programme. The contracts were reviewed and assessed by technical experts against the criteria contained in the Goods Review List (see S/2002/515) and its accompanying amendment (see resolution 1454 (2002)).

VIII. UNMOVIC readiness

143. At the request of the President of the Council, the Executive Chairman briefed the Council on 22 April 2003 on the practical matter of how UNMOVIC should maintain a readiness to resume work in Iraq should the Council so decide. That information is elaborated below.

144. On 22 May 2003, the Council adopted resolution 1483 (2003), in which it reaffirmed the importance of the disarmament of Iraqi weapons of mass destruction and of eventual confirmation of that disarmament. It also reaffirmed the duty of Iraq to meet its disarmament obligations, and invited the United Kingdom and the United States to keep the Council informed of their activities in that regard, and underlined the intention of the Council to revisit the mandates of UNMOVIC and IAEA.

A. Effect of resolution 1483 (2003)

145. At the time when UNMOVIC inspections in Iraq were suspended, they were based upon and guided in particular by Security Council resolutions 687 (1991), 1284 (1999) and 1441 (2002). It is evident that the premises upon which those resolutions were based have been substantially altered with the occupation of Iraq and that the resolutions themselves have in part become inoperable. For instance, the provision in resolution 1284 (1999) enabling the Security Council to suspend sanctions is evidently obsolete since the Council has already lifted the sanctions.

146. It may be taken as a general rule that where two resolutions adopted by the Security Council cannot be reconciled the later resolution prevails over and supersedes the earlier. To the extent, however, that earlier resolutions can be reconciled with a newer resolution, they remain in force and are applicable. It is concluded, accordingly, that the Council is retaining UNMOVIC as a subsidiary organ until any other decision is taken. It is also concluded that while Iraq remains obliged to disarm the Security Council is looking to the United Kingdom and the United States to keep the Council informed about their activities. By implication, it

follows that their engagement in the disarmament process has the acceptance and support of the Council. Nothing is said in resolution 1483 (2003) about ongoing monitoring and verification. Since that was an important part of earlier resolutions and it does not seem incompatible with the new resolution, it would seem reasonable to conclude that the Council has not intended to rescind it.

B. Equipment

147. In respect of inspection and support equipment, UNMOVIC is better prepared to perform its mandated mission at the present time than when the inspectors first arrived in Iraq in November 2002. Initial reports that the UNMOVIC premises in the Canal Hotel were completely looted turned out to be false. All of UNMOVIC's 34 local employees survived the war. On their own initiative, several of them worked with coalition forces to secure BOMVIC and its equipment — even to the point of driving with coalition forces to attempt to recover stolen United Nations vehicles. They recovered two vehicles.

148. The local staff was able to report that 10 rooms on the third floor of BOMVIC were not entered during the looting, including the chemical and biological laboratories, the communications rooms and workshops, the IAEA room, the medical facility and several administrative offices. In addition, five of the large equipment containers in the parking area were not entered and the mobile chemical laboratory was intact.

149. According to inventories compiled by the inspectors, equipment in the secured rooms and containers at BOMVIC includes chemical agent monitors, digital still and video cameras, Global Positioning System devices, voice recorders and equipment in the laboratories for performing chemical and biological analysis, including gas chromatographs. In addition, there is sufficient equipment to re-establish a computer network, satellite and VHF communications in a few days, as well as protective suits and gas masks and other protective gear, and sufficient computers, printers and monitors to start operations.

150. Although the looters apparently left nearly all the significant inspection equipment, they did take 62 UNMOVIC vehicles, several computers, printers and monitors and a large amount of furniture. If it were decided that UNMOVIC should restart operations in Iraq, that common equipment would be available from the United Nations Logistics Base in Brindisi, Italy, and could be flown in on short notice. A fixed-wing aircraft could be obtained on fairly short notice; helicopters, however, might take longer to obtain (as was the case in 2002).

C. Staff

151. As of the end of May 2003, UNMOVIC has 70 inspectors from the roster still on contract until early/mid-June 2003. They are currently on leave of absence and could be recalled for inspection work at any time. After June, if some activities were to be resumed, UNMOVIC would depend on the reactivation of those and other inspectors on the roster, as was done in November 2002. Such reactivation would take about four weeks from the time a decision was taken to resume operations in Iraq.

152. In New York, some staff have not extended their contracts in the current situation, but to date most headquarters-based UNMOVIC personnel have remained on board. They have been completing the work arising from previous inspections, both analysis and assessment of data.

153. About 30 staff members in New York — mainly the Operations and Analysis Divisions — could form the core of the first inspection teams if the Council were to decide that UNMOVIC was to resume work in Iraq. Later, they could be replaced by staff from the roster. Within two weeks after a decision on resumption of work, they would be able to start the necessary activities. The laboratories for screening chemical and biological samples could be reactivated within the same time frame. From the some 90 vehicles available for use by the inspectors, only 16 appear to remain for use after some repairs; 33 local staff are currently under contract until the end of June 2003.

154. Despite the losses, BOMVIC could probably go back into limited operations within two weeks after a return of staff. Thus, UNMOVIC would be ready to resume work in Iraq at the service of the Council.

155. As a result of the experience gained in the field in terms of inspection work and the infrastructure built in connection with such inspections, both in the analysis and logistic areas, UNMOVIC is currently capable of forming teams of inspectors with experience and up-to-date knowledge on a vast range of dual-use sites in Iraq and the capabilities of those sites, including material and equipment that existed on-site until March 2003. UNMOVIC maintains a large database of sites, material and equipment of dual-use nature previously subject to monitoring. That database and archives of more than one million pages includes inspection reports, interview testimony, supplier information, and documents and other materials from Iraq, and continues to be updated.

156. At the UNMOVIC premises in the Canal Hotel in Baghdad, there is a laboratory-screening capability backed with an arrangement with well recognized reference laboratories in six countries. UNMOVIC also has experience with chemical and biological laboratory equipment, which could be moved within a reasonable time to virtually any location within Iraq for screening activities. The equipment is still available. The UNMOVIC infrastructure, logistics and equipment remains in place for searches, verification activities, interviews and monitoring missions, with a large number of inspectors trained in site inspection and searches with the ability to recognize dual-use equipment and processes. UNMOVIC retains the logistical capability of supporting an average of five to eight inspection teams per day, visiting 10 sites per day.

157. The personnel of UNMOVIC who have experience in Iraq or have served on its headquarters staff also have a great deal of knowledge of the Iraqi individuals involved in proscribed programmes and also in declared permitted activities at universities, research institutions, industrial and military organizations.

158. UNMOVIC also interacted with many Governments in the area of export control, in particular in finding practical solutions to such matters as defining material as dual-use and finding the appropriate balance between the non-proliferation goals and legitimate commerce. The experience gained in that respect by UNMOVIC will be invaluable if it is decided to maintain an export/import monitoring mechanism for certain exports to Iraq.

IX. College of Commissioners

159. The College of Commissioners held its thirteenth regular plenary session at United Nations Headquarters on 28 May 2003. As on previous occasions, in addition to the members of the College, observers from IAEA and the Organization for the Prohibition of Chemical Weapons attended.

160. At the outset, the Executive Chairman made a brief statement introducing his draft report to the Security Council and highlighting various matters, such as the inspection conducted in Iraq and the recent adoption of Security Council resolution 1483 (2003) on Iraq.

161. Presentations were also made by UNMOVIC staff on different aspects of inspection activities, covering:

(a) An overview of UNMOVIC operations since resuming inspections;

(b) Destruction of materials in the missile area;

(c) The location, analysis and disposal of munitions by UNMOVIC;

(d) Chemical and biological sampling and analysis;

(e) Iraq's remotely piloted vehicles/unmanned aerial vehicles programme;

(f) Iraq's mobile facilities.

One Commissioner provided additional information concerning Iraq's mobile facilities in a paper entitled "Iraqi mobile biological warfare agent production plants".

162. The College welcomed the Executive Chairman's introductory statement and the presentations, which were considered useful and informative. The view was expressed that a compendium encompassing the knowledge and experience gained by UNMOVIC and its predecessor over the years would be useful as an objective record. In the course of the discussions, questions were raised about the effect of resolution 1483 (2003) on the UNMOVIC mandate. The Executive Chairman observed that even though some of its mandated functions were no longer operable, UNMOVIC continued to be a subsidiary organ of the Security Council until the Council decided otherwise. The College noted the experience gained by and available within UNMOVIC and the usefulness of those assets being maintained for the benefit of non-proliferation in the future.

163. The College recommended that in revisiting the UNMOVIC mandate and considering the process of the eventual confirmation of the disarmament of Iraq as envisaged in resolution 1483 (2003), the Security Council take into account UNMOVIC experience and expertise in inspections and ongoing monitoring.

164. While taking note of the intention of the Executive Chairman to retire from his post, the College paid tribute to Dr. Blix's leadership in the establishment of a credible and highly professional mechanism of inspections and monitoring in Iraq, as requested by the Security Council. His dedication, professionalism and independence were highly appreciated.

165. It was decided to hold the next session of the College on 21 August 2003 in New York.

166. In accordance with paragraph 5 of resolution 1284 (1999), the Commissioners were consulted on the contents of the present report.

Notes

[a] The Commission's 12 previous reports were issued as documents S/2000/516, S/2000/835, S/2000/1134, S/2001/177, S/2001/515, S/2001/833, S/2001/1126, S/2002/195, S/2002/606, S/2002/981, S/2002/1303 and S/2003/232.

Appendix I

Destruction, removal or rendering harmless of proscribed items and materials in Iraq, 1991 to 1998[a]

A. Ballistic missiles

1. Destruction of items declared during the period 1991-1993

1. The major part of Iraq's proscribed missile items and capabilities that remained after the 1991 Gulf War were destroyed by Iraq unilaterally and without international supervision. A significant portion of Iraq's ballistic missile production capabilities was also destroyed or heavily damaged during the Gulf War.

2. UNSCOM supervised Iraq's destruction of its declared proscribed missile capabilities and materials remaining after the Gulf War from 1991 to 1993. The items destroyed included (see S/1999/94):

- 48 proscribed missiles and 50 warheads
- 20 tons of proscribed missile fuel and 52 tons of oxidizer
- Five combat mobile launchers, one training mobile launcher, indigenously produced launching equipment and two associated launch control vehicles, three prototype launchers and 56 fixed launch sites
- About 80 pieces of critical equipment for the production of proscribed solid propellants, 11 relevant buildings and raw materials
- Some 75 pieces of components acquired for both 350 mm and 1,000 mm guns

2. Destruction of additional proscribed items identified by UNSCOM after 1993

3. By early 1995, UNSCOM had accumulated evidence that not all proscribed items had been declared by Iraq and that the ongoing involvement of retained dual-use items in proscribed activities had been concealed. Although the items in question were not weapons per se, they included an additional six units of production equipment, flow-forming machines, vacuum furnaces, a turbo pump test stand and a balancing machine. They were designated for destruction, which was completed in July 1995 despite strong protest from Iraq. However, in November 1995 Iraq finally acknowledged that the equipment destroyed had indeed been specifically procured for and used in proscribed activities.

4. UNSCOM identified other specific instances of Iraq's activities after 1991 that were in violation of the relevant Security Council resolutions. For example, a shipment of proscribed missile gyroscopes destined for Iraq was intercepted en route to Iraq in 1995 (see S/1996/848).

5. All proscribed items identified after 1993 represented certain portions of ballistic missile production capabilities and relevant missile components but not operational missiles.

[a] The Commission's "clusters" document, which was declassified on 6 March 2003, in part addresses what remained unaccounted for with respect to Iraq's weapons of mass destruction programmes.

B. Chemical weapons

1. Destruction of declared items during the period 1991-1994

6. In the chemical weapons area, a significant portion of Iraq's production capabilities were destroyed or damaged through aerial bombardment in 1991. Sizeable quantities of chemical weapons and their components, including empty munitions and precursor chemicals, were also destroyed by Iraq unilaterally and without international supervision.

7. A significant number of remaining weapons declared by Iraq, as well as related subsystems and components, were destroyed under UNSCOM supervision in the period from 1991 to 1994, including:

- 38,537 filled and unfilled chemical munitions
- 690 tons of chemical warfare agents
- More than 3,000 tons of precursor chemicals
- More than 100 pieces of chemical weapons production equipment

2. Destruction of additional items identified by UNSCOM after 1994

8. In 1996, UNSCOM found new evidence of chemical production and analytical equipment and precursor chemicals acquired for chemical weapons purposes still remaining in Iraq. Many of those items had been exempted from destruction by the Commission in 1995 on the basis of false Iraqi declarations as to their past use or intended purpose. In 1997, UNSCOM designated for destruction and supervised the disposal of the following newly identified items and materials (see S/1996/848):

- 325 pieces of production equipment (of those, possession of 120 pieces was only disclosed by Iraq in August 1997);
- 125 pieces of analytical instruments;
- 275 tons of precursor chemicals.

9. In addition, UNSCOM discovered that in 1990 many pieces of analytical instruments had been removed by Iraq from Kuwait for use in its chemical weapons programme. At the request of the Government of Kuwait, 91 items of analytical equipment from Kuwait City University were returned by UNSCOM to Kuwait in 1997.

10. In addition to discoveries in the missile area, findings in the chemical area comprised hidden production capabilities but not weapons themselves, with the exception of a dozen artillery shells filled with mustard gas found in the period 1996-1997 at a former storage site. However, it should be noted that more chemical weapons production equipment was identified and destroyed in 1997 than in the period from 1991 to 1994 (325 and 100 pieces of equipment, respectively).

C. Biological weapons

1. Period 1991-1995

11. From 1991 to 1994, Iraq consistently denied that it had had an offensive biological warfare programme. Subsequently, no biological weapons or any of their components and production capabilities were declared and destroyed by Iraq under UNSCOM supervision. In July 1995, Iraq finally admitted to having had an offensive biological weapons programme. However, weaponization was still denied. The weaponization and the broader scope of the programme were disclosed only in August 1995 after the departure from Iraq of Lieutenant-General Hussein Kamel. However, Iraq continued to maintain that all biological munitions and biological warfare agents produced had been destroyed unilaterally in 1991 along with the associated documentation.

2. Destruction of equipment and materials after 1995

12. In 1996, the Al Hakam facility, including buildings, equipment and materials therein, was destroyed by Iraq under UNSCOM supervision through demolition. In addition, the equipment from Al Manal and Al Safah sites, two other facilities that had been used in the proscribed programme, was transported to Al Hakam and destroyed there. The air handling system for high containment at Al Manal was inactivated. The growth media procured by Iraq for the proscribed activities was also destroyed (see S/1997/774).

Appendix II

Composition of the roster of trained inspectors as of May 2003

Country	*Headquarters inspectors*[a]	*Outside inspectors*[b]	*Total*
Algeria		4	4
Argentina	1	13	14
Australia	2	21	23
Austria	2	11	13
Bangladesh		7	7
Belarus		3	3
Belgium		3	3
Brazil	1	3	4
Bulgaria		1	1
Burkina Faso		1	1
Cambodia		1	1
Canada		4	4
Chile	1	3	4
China	3	9	12
Croatia		2	2
Denmark		1	1
Ethiopia		7	7
Finland	1	9	10
France	5	30	35
Germany		10	10
Greece	1		1
Hungary		5	5
Ireland		2	2
Italy		4	4
Japan	2	1	3
Jordan		6	6
Kenya		1	1
Lebanon		1	1
Mexico		2	2
Morocco		1	1
Nepal		3	3
Netherlands	1		1
New Zealand		1	1
Nigeria		2	2
Norway		5	5
Peru		3	3

Country	*Headquarters inspectors*[a]	*Outside inspectors*[b]	*Total*
Poland	2	4	6
Qatar		1	1
Republic of Korea		9	9
Republic of Moldova		1	1
Romania	2	12	14
Russian Federation	3	20	23
Serbia and Montenegro		1	1
Slovakia	1	7	8
Spain		1	1
Sweden	1	5	6
Switzerland		2	2
Thailand		5	5
Tunisia		1	1
Turkey		4	4
Ukraine	1	6	7
United Kingdom	3	11	14
United States	7	39	46
Zambia		4	4
Zimbabwe		1	1
Grand total (55 countries)	**40**	**314**	**354**

[a] 28 inspectors served in Iraq.
[b] 106 inspectors served in Iraq with UNMOVIC.